

# EUGEN J. IONAȘCU

## PERSONAL INFORMATION

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## EDUCATION

Texas A&M University  
Ph.D in Mathematics, 1997  
Graduated with Honors  
ADVISORS: Carl M. Percy and David Larson  
THESIS SUBJECT: *Operators and applications to wavelets*

University of Bucharest  
Master in Mathematics, 1987  
Operators and Functional Analysis  
ADVISOR: Reseacher Mihai Putinar

University "Al. Ioan Cuza", Iasi, Romania  
Bachelor in Mathematics, 1986  
THESIS ADVISOR: Dr. Ștefan Frunza  
THESIS SUBJECT: *Spectral properties for Banach algebra elments*

## RESEARCH EXPERIENCE

Institute of Mathematics "Simion Stoilov" of the Romanian Academy  
1987-1993 Ph.D. Program with Florian Horia Vasilescu  
Operator Spectral Theory  
1993 Defended Phase I, without final defense

The University of Georgia  
1997-1999 Post Doctoral Position  
MENTOR: Dr. Edward Azoff  
Wandering sets

Georgia Institute of Technology  
2005-2006 Faculty Exchange program  
MENTOR: Dr. Yang Wang and Dr. Chris Heil  
Wavelet Sets

## TEACHING EXPERIENCE

University of Bucharest, Romania  
1987-1993 Recitations in Complex Analysis I and II  
Professor Cabiria A. Cazacu  
Recitations in Real Analysis

Ovidiu University, Constanta, Romania  
1990-1993 Introductory Mathematics Courses  
Supervisor Professor Silviu-Florian Sburlan

Columbus State University, Columbus, GA  
1999- Most of the courses in the curriculum  
*Preparatory Algebra, Mathematical Modelling, College Algebra, Trigonometry (Pre-calculus), Applied Calculus, Calculus I, Calculus II, Calculus III, Geometry for Elementary Education majors, College Geometry, Number Theory, Real Analysis I and II, Abstract Algebra I and II, Linear Algebra, Set Theory, Numerical Analysis, Differential Equations, Senior Seminar, Intro to Probability, Number Sense for elementary teachers, Foundations of Mathematics, History of Mathematics, Complex Analysis, Actuarial Mathematics I, Discrete Mathematics and Putnam Exam Preparation (training course), 100% online courses- Number Theory, College Geometry, Discrete Math, History of Math, and about four of these upper level math classes online*

Columbus State  
University,  
Columbus, GA

2019-2021 100% online courses  
Number Theory, College Geometry, Discrete Math, History of Math

## WORK EXPERIENCE

MAA

2021- Grading for the Putnam Competition

Mathematics  
Magazine

2012- Assistant Problem Section Editor

Columbus State  
University,  
Columbus, GA

1999-2002 Assistant Professor  
2002-2008 Associate Professor  
2008- Full Professor  
2006-2009 Associate Chair of Mathematics Department

Institute of  
Mathematics  
"Simion Stoilov" of  
the Romanian  
Academy

1987-1993 Researcher Level I

## GRANTS & AWARDS

- Nominated for the research award (from the college of sciences) in 2017
- Mini-sabbatical, Spring 2012
- Research internal grants in 2010 and 2011
- Nominated for research award and finalist (2006 and 2007), CSU
- Honorary Member of the Institute of Mathematics "Simion Stoilov" of the Romanian Academy
- Faculty development program at Georgia Institute of Technology, 2005-2006
- AMS Travel Grant to the conference "Mathematical Challenges of the 21st Century", UCLA, CA, 2000
- AMS Travel Grant to the Congress of Mathematics in Berlin, Germany, August 1998
- Member of The Mathematical Association of America 1999-2012
- Member of The American Mathematical Society since 1993-2012
- Member of The Phi Kappa Phi Honor Society
- Member of Phi Beta Delta honor society for international scholars, Delta Nu chapter
- Gusemann Prize for Excellence (awarded to graduate students at the Mathematics Department of Texas A&M University), August 19th, 1997
- Second prize at the Undergraduate Mathematical Olympiad (freshmen and sophomores students) held in Sofia, 1984
- Various prizes in about 12 high school mathematical competitions

## COMPUTER SKILLS

<i>Basic</i>	Webpage design tools (FileZila, etc), Paint Shop Professional, Adobe Acrobat
<i>Intermediate</i>	Microsoft Excel, Microsoft Word
<i>Advanced</i>	L <sup>A</sup> T <sub>E</sub> X, Mathematica, Maple, Maple Programming, LPSolve (Integer Linear Programming), Geometer's Sketchpad

## OUTREACH & INVOLVEMENT

- coordinator of senior thesis of two Columbus High School students
- Assistant Editor for Mathematics Magazine, Problem Section (Proposals) (2012-) (Edited Problems: 1852, 1858, 1963, 1866, 1871, 1881, 1889, 1892, and 1917)
- CSU-Calculus Contest (test writer), 2013- (<http://ejionascu.ro/calculuscontests/links.pdf>)
- Colloquium coordinator (2008-2014) (<http://math.columbusstate.edu/colloquia.php>)
- Research grants awards committee (2013-2014)
- Research CSU award committee (2-13-2014)
- CSU Research awards committee, 2010-2011
- Other mathematics competitions (two Universities in Michigan contracted me for writing and grading their annual math challenge test)
- Reviewer for International Journal of Mathematics, MathSciNet, and referee in my areas of expertise
- Publications Committee, 2006-2009
- Search Committee, 2006-2009
- Faculty Development Committee's chair, 2004-2005, 2009-2010
- Member of the Graduation Committee, 2004-2010
- Member of International Education Committee at CSU (2004-)(chair of the Scholarship Subcommittee 2010, and chair of the European Studies Subcommittee in 2010-2011), chair of the Fort Scholar Subcommittee
- Member of the Faculty Handbook Committee, CSU, 2000-2002
- Chair of the CSU Invitational High School Tournament from 2001 to 2004
- Writer and grader of the 27th annual Lower Michigan Mathematics Competition ([www.svsu.edu/mathematics/lmmc/](http://www.svsu.edu/mathematics/lmmc/)).
- Chair of the CSU High School Invitational Math Tournament 2002, 2003, 2004
- Advisor for the Math Club, 2000-2001, 2009-2010

## TALKS & PRESENTATIONS

- July 22nd, 2016, Talk in the REU summer session, “Ehrhart polynomial for lattice regular tetrahedrons”, University of West Georgia
- January 29-31, 2016 Auburn Conference on Designs, Graphs, and Codes
- July 10, 2015, Talk in the REU summer session, “ Ehrhart polynomial for lattice squares, cubes and hypercubes”, University of West Georgia
- October 26th, 2013 Integers Conference, University of West Georgia, “Characterization of equidistant points in  $\mathbb{Z}^4$ ”
- April 6th, 2012 Seventeenth Annual Mathematics Technology Conference, Valdosta State University, talk “Half domination arrangements in regular and semi-regular tessellation type graphs”, slide on my web-page
- October 27th, 2011 Integers Conference, University of West Georgia, “Lattice regular polyhedrons and their Ehrhart polynomial”
- March 2011, TROY MathFest 2011, Troy University at Dothan, AL, talk “Existence of regular polyhedrons in space with integer coordinate”
- February 25, 2011 Sixteenth Annual Mathematics Technology Conference, Valdosta State University, talk “Modeling with Maple some Geometric Probabilities”, slide on my web-page
- November, 2010 Mini-Conference in Harmonic Analysis, and Department Colloquium, (joint with R. Stephens) Title Talk: “Moments and the range of the derivative”
- June 26th, 2010 Additive Combinatorics Mini-Conference at GA Tech, organizer Ernie Croot
- October 16th, 2009 Integers Conference, University of West Georgia, Platonic solids “in  $\mathbb{Z}^3$ ”
- November 20th, talk in the the Mathematics CSU Colloquium with the title “Regular tetrahedra in the lattice  $\mathbb{Z}^3$  with the Euclidean distance
- October, 2007 Integers Conference, University of West Georgia, talk, “Counting all equilateral triangles in  $\mathbb{Z}^3$ ”
- MAA-SE meeting on March 16-17, 2007, talk titled “Maximum k-non-attacking sets of kings on chessboards via binary linear programming analysis”
- Twelfth Annual VSU Mathematics Technology Conference, February 23, 2007, Education Center Valdosta State University, talk titled “Calculating the number of equilateral triangles in  $\{0, 1, \dots, n\}^3$ ”
- talk in the Mathematics Colloquium, “Wavelet set old and new”, Columbus State university, October 26th 2006
- September 2006, TEAM Math participant at Tuskegee conference in mathematics education, AL
- August 7-11, 2006, Concentration week in “Frames, Banach Spaces, and Signal Processing”, Texas A&M University, College Station, TX

- May 18-20, 2006, Nineteenth Annual Cumberland Conference on Graph Theory, Combinatorics, and Computing, East Tennessee State University, Johnson City, Tennessee, talk about progress on “Bounds on the cardinality of a minimum  $\frac{1}{2}$ -dominating set in the king’s graph”,
- March 31st, 2006, Talk at the Joint Meeting Southeastern Section MAA & IAM Southeast Atlantic Section, Auburn University, Auburn, AL,
- February 24-26, 2006, Talk at the Workshop on Harmonic Analysis and Fractal Geometry, Louisiana State University, Baton Rouge, LA
- November 2005, Talk at Columbus State University in the Max Club, “Equilateral triangles with integer coordinates in  $\mathbb{R}^n$ ”.
- June 7-12, 2005, The 25th Great Plains Operator Theory Symposium, UCF, Orlando, FL
- September 2005, TEAM Math participant at Tuskegee conference in mathematics education, AL
- February 2005, Attended the Tenth Annual Valdosta State University Mathematics Technology Conference, and delivered a talk with the title “Bounds on the cardinality of a minimum  $\frac{1}{2}$ -dominating set in the king’s graph”
- Annual AMS meeting, January 2005, participant.
- November 5th, 2004, Colloquium Talk at University of Auburn at Montgomery (MAM Seminar), *Title: Maximal cardinality  $q$ -dependent sets in  $d$ -degree graphs and  $\alpha$ -dominating sets*
- June 24-28, 2004, Great Plains Operator Theory Symposium, College Station, TX
- February 2004, Attended the Ninth Annual Valdosta State University Mathematics Technology Conference, and delivered a talk with the title “Extreme values for the area of rectangles with vertices on concentric circles”,
- March 21-23, 2003, SEAM 19, University of Tennessee, Knoxville, Tennessee
- November 2002, Nineteenth Auburn Mini conference on Harmonic Analysis and Related Areas, Auburn, Alabama
- November 9-10, 2002, 982nd AMS Meeting, had a talk in the Special Session on Functional and Harmonic Analysis of Wavelets, Frames and their applications, Orlando, FL
- August 6-9, 2002, IWOTA2002 Conference (Thirteenth International Workshop on Operator Theory and Applications), Blacksburg, Virginia, talk on the “Connectivity of wavelet sets”
- February 2002, Attended the Seventh Annual Valdosta State University Mathematics Technology Conference, and delivered a talk with the title “Infinite double arithmetic progressions”
- December 2001, Eighteenth Auburn Mini conference on Harmonic Analysis and Related Areas, Auburn, Alabama

- February 23rd, 2001, Attended the Sixth Annual Valdosta State University Mathematics Technology Conference, and delivered a talk with the title "The Poncelet's Closure Theorem with Maple and Sketchpad"
- March 30-31st, 2001, 80th Meeting of the Southeastern Section of the Mathematical Association of America, Huntingdon College, Montgomery, Alabama
- October 26-27, 2000, Attended the 3rd Annual CSU Mathematical Modeling Conference
- December 2000, Seventeenth Auburn Mini conference on Harmonic Analysis and Related Areas, Auburn, Alabama
- April 2000, The 6th Annual Cantrell Lectures, University of Georgia, Athens (Special speaker: Sir Michael Atiyah)
- August 2000, "Mathematical Challenges of the 21st Century", UCLA. (The trip was partially supported by an NSF grant)
- November 17-18, 2000, Attended the Sixteenth Auburn Mini-conference on Harmonic Analysis and Related Areas (November 17-18, 2000)
- December 1999, Sixteenth Auburn Mini-conference on Harmonic Analysis and Related Areas, Auburn, Alabama
- January 13-16, 1999, AMS annual meeting, San Antonio, Functional and Harmonic Analysis of Wavelets's Session
- May 1999, SEAM XV, Nashville, Tennessee
- 1998 SEAM XIV, Tuscaloosa, Alabama, talk on "Wandering sets for piecewise linear maps of  $[0, 1]$ ".
- 1997 Multiwavelets: Theory and Applications, Hunstville, Texas
- 1997 YAMS, Maggie Valley, North Carolina
- 1997-1998 UGA Analysis Seminar
- November 1998, Georgia Institute of Technology, Analysis Seminar, talk on "Direct paths of wavelets"
- 1996 GPOTS, Phoenix, Arizona
- 1996 SUMIRFAS, College Station, Texas
- 1996 UNC Conference on Wavelets, Charlotte, North Carolina, July, 1996

## PUBLICATIONS

1. *Apollonius "circle" in Spherical Geometry*, *International Journal of Geometry*, 9(2020), No. 1, pp. 75 - 84
2. *Ehrhart polynomial for lattice squares, cubes and hypercubes*, *Revue Roumaine de Mathematique Pures et Appliques*, xx(1) (2019), pp. 50-63
3. *Random triangles in planar regions containing a fixed point*, *Rend. Circ. Mat. Palermo* 68(2019), Issue 2, pp. 363-383

4. **A variation on bisecting the binomial coefficients**, *Discrete Applied Mathematics*, 250(2018), pp. 276-284
5. **Apollonius "circle" in Hyperbolic Geometry**, *Forum Geometricorum*, 18 (2018), pp. 135-140
6. **Bisecting binomial coefficients**, with T. Martinsen and P. Stănică, *Discrete Applied Mathematics*, 227(2017), pp. 70-83
7. **Gaussian Integers and Unit Fractions**, with Kyle Bradford, to appear in *Acta Math. Univ. Comenianae*, *Acta Math. Univ. Comenianae*, LXXXVI (2017), pp. 127-141
8. **New parametrization of  $A^2 + B^2 + C^2 = 3D^2$  and Lagrange's four-square theorem**, *An. Stiint. Univ. Al. I. Cuza Iasi. Mat. (N.S.)* (2015)
9. **The signum equation for Erdős-Surányi sequences**, with Dorin Andrica, vol. 15A (2015): *Proceedings of Integers 2013: The Erdos Centennial Conference*
10. **A geometric reduction of the Erdős-Straus conjecture**, with Kyle Bradford, *Advanced Modeling and Optimization*, 17(1) (2015), pp. 41-54
11. **Equilateral triangles in  $\mathbb{Z}^4$** , *Vietnam J. Math.* vol. 43(3) (2015), pp. 525-539
12. **On a conjecture on the number of polynomials with coefficients in  $[n]$** , with Dorin Andrica, Sneha Chaubey, and Alexandru Zaharescu, *Bull. Math. Soc. Sci. Math. Roumanie*, vol. 58(106) (2015), pp. 19-31
13. **Some unexpected Connections between Analysis and Combinatorics**, with Dorin Andrica, *Mathematics without boundaries: survey in pure mathematics*, Themistocles M. Rassias and Panos Pardalos, Editors, Springer (2014)
14. **On polynomials with coefficients in  $[n]$** , with Dorin Andrica, *An. St. Univ. Ovidius Constanta*, Vol. 22(1), 2014, 13-23
15. **Primes of the form  $\pm a^2 \pm qb^2$** , with Jeff Patterson, *Stud. Univ. Babeş-Bolyai Math.* 58 (2013), No. 4, pp. 421-430
16. **Estimations of the Rate of Interest for an Annuity Certain**, with R. Stephens, *Journal of Financial and Economic Practice*, 13(2)(2013), pp. 84-97
17. **Lattice Platonic Solids and their Ehrhart polynomial**, *Acta Math. Univ. Comenianae*, 82(1) (2013), pp. 147-158
18. **Ehrhart's polynomial for equilateral triangles in  $\mathbb{Z}^3$** , *Australas. J. Combinatorics*, 55 (2013), pp. 189-204
19. **Things to do with a broken stick**, with Gabriel Prajitura, *International Journal of Geometry*, vol. 2(2) (2013), pp. 5 - 30
20. **Cubes in  $\{0, 1, \dots, n\}^3$** , with Rodrigo Obando, *Integers*, vol. 12A (2012) (John Selfridge Memorial Issue), Art. A9
21. **Regular octahedrons in  $\{0, 1, \dots, n\}^3$** , *Fasc. Math.*, 48 (2012), pp. 49-59
22. **Moments and the Range of the Derivative**, with Richard Stephens, *Real Analysis Exchange*, 37(1) (2012), pp. 1-17

23. [Half domination arrangements in regular and semi-regular tessellation type graphs](#), *Advanced Modeling and Optimization*, 14(1) (2012), pp. 233-245
24. [Regular tetrahedra with integer coordinates of their vertices](#), *Acta Math. Univ. Comenianae*, 80(2) (2011), pp. 161-170
25. [On the Erdos-Straus conjecture](#), with A. Wilson, *Revue Roumaine de Mathematique Pures et Appliques*, 56(1) (2011), pp. 21-30
26. [Platonic solids in  \$\mathbb{Z}^3\$](#) , with A. Markov, *J. Number Theory*, 131 (2011), pp. 138-145
27. [On positivity of bivariate polynomials](#), *GMA*, (2010), pp. 134-136
28. [Certain Binomial Sums with recursive coefficients](#), with E. Kilic, *Fibonacci Quart.*, 48(2) (2010), pp. 161-167
29. [On independent sets in purely atomic probability spaces with geometric distribution](#), with A. Stancu, *Acta Math. Univ. Comenianae*, 79(1) (2010), pp. 31-38
30. [Introduction to the Prisoners vs. Guards Puzzle](#), with T. Howard and D. Woolbright, *Journal of Integer Sequences*, 12 (2009), Art. 09.1.3
31. [A characterization of regular tetrahedra in  \$\mathbb{Z}^3\$](#) , *J. Number Theory*, 129 (2009), pp. 1066-1074
32. [k-Dependence and domination in king's graph](#), with D. Pritkin and S. Wright, *Amer. Math. Monthly*, 115(9), (2008), pp. 820-836
33. [Twin problems on non-periodic functions](#), *Crux Mathematicorum with Mathematical Mayhem*, 34(7) (2008), pp. 424-429
34. [A characterization of all equilateral triangles in  \$\mathbb{Z}^3\$](#) , with Ray Chandler, *Integers*, 8 (2008), Art. A19
35. [Minimal Niven numbers](#), with F. Luca, P. Stanica and H. Fredricksen, *Acta Arith.*, 132 (2008), pp. 135-159
36. [Counting all equilateral triangles in  \$\{0, 1, 2, \dots, n\}^3\$](#) , *Acta Math. Univ. Comenianae*, 77(1) (2008), pp. 129-140
37. [Remarks on a sequence of minimal Niven numbers](#), with F. Luca, P. Stanica and H. Fredricksen, *Proceedings of the International Workshop, SSC (2007) (Sequences, Subsequences and Consequences)* Springer, pp. 162-168
38. [A proof of two conjectures related to Erdős-Debrunner inequality](#), with P. Stanica and C. L. Frenzen, *J. Inequal. Pure and Appl. Math*, 8(3) (2007), Art. 68
39. [A parametrization of equilateral triangles having integer coordinates](#), *Journal of Integer Sequences*, 10 (2007), Art. 07.6.7
40. [Heron triangles with two fixed sides](#), with F. Luca and P. Stanica, *J. Number Theory*, 126(1) (2007), pp. 52-67
41. [Extreme values for the area of rectangles with vertices on concentric circles](#), with P. Stanica, *Elemente der Mathematik*, 62 (2007), pp. 40-43
42. [Simultaneous Translational and Multiplicative Tiling and Wavelet Sets in  \$\mathbb{R}^2\$](#) , with Yang Wang, *Indiana Univ. Math. J.*, 55(6) (2006), pp. 1935-1949



43. On ring homomorphisms of  $C(\mathbb{R})$  whose range consists of smooth functions, *Gazeta Matematica, A series*, 4, 2006
44. *Effective Asymptotics for Some Nonlinear Recurrences and Almost Doubly-Exponential Sequences*, with P. Stanica, *Acta Math. Univ. Comenianae. (N.S.)* 73(1) (2004), pp. 75-87
45. *A new construction of wavelet sets*, *Real Anal. Exchange* 28(2) (2003), pp. 593-609
46. *Direct paths of wavelets*, with Edward Azoff, D. R. Larson and C. Percay, *Houston J. Math.* 29(3) (2003), pp. 737-756
47. *Rank-one perturbations of diagonal operators*, *Integral Equations and Operator Theory*, 39 (2001), pp. 421-440
48. *Wandering sets for a class of Borel isomorphisms of  $[0, 1)$* , with Edward Azoff, *The Journal of Fourier Analysis and Applications*, 6 (2000), pp. 623-638
49. *On subwavelet sets*, with C. M. Percay, *Proc. Amer. Math. Soc.*, 126 (1998), pp. 3549-3552
50. *On wavelet sets*, with D. R. Larson and C. M. Percay, *J. Fourier Anal. and Appl.*, 4(6) (1998), pp. 711-721
51. *On the unitary systems affiliated with orthonormal wavelet theory in  $n$ -dimensions*, with C. Percay and D. Larson, *J. Funct. Anal.*, 157 (1998), pp. 413-431
52. *On the structure of operators and wavelets*, Ph.D. Thesis, Texas A&M University, (1997)
53. *On power bounded operators*, *Proc. Amer. Math. Soc.*, 125 (1997), pp. 1435-1441
54. Jordan decomposition and factorization for nonnegative operator-valued functions, *Rev. Roumaine Math. Pures Appl.*, 37 (1992), pp. 691-699.
55. *Joint spectral properties for permutable linear transformations*, with Florian-Horia Vasilescu, *J. Reine Angew. Math.* 426 (1992), pp. 23-45

January 12, 2022